

# ROBOTIC SURGERY IN OPTOMETRY

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## 1. Introduction

- Robotic surgery is revolutionizing microsurgical procedures in ophthalmology by enhancing precision, control, and reproducibility.
- The need for greater surgical accuracy, especially in retinal and corneal surgeries, has driven the integration of robotics into eye care.

## 2. Objectives

- To explore current advancements in robotic-assisted ophthalmic surgeries.
- To evaluate the benefits and limitations of robotic systems.
- To discuss future directions in robotic applications in ophthalmology.

## 3. Methods

- Literature Review: A narrative review of peer-reviewed articles from PubMed, Scopus, and Web of Science (2010–2024).
- Keywords Used: Ophthalmology, Robotic Surgery, Microsurgery, Visual Outcomes, Precision Technology.

## 4. Applications in Ophthalmology

- Robotic Vitreoretinal Surgery: Using systems like the Preceyes Surgical System for high-precision retinal interventions.
- Corneal Transplantation: Robotic-assisted keratoplasty procedures.
- Cataract Surgery: Integration of femtosecond laser systems.
- Strabismus Surgery: Robot-assisted alignment procedures with enhanced safety in pediatric cases.

## 5. Advantages

- Tremor filtration and micro-precision
- Enhanced surgeon dexterity and control
- Remote surgery possibilities
- Consistent surgical outcomes

## 6. Limitations

- High cost of robotic systems
- Limited clinical trials and surgeon training
- Technical complexity and steep learning curve

## **7. Future Perspectives**

- AI-integrated robotic platforms
- Telerobotic surgery in remote regions
- Use in ocular oncology and gene therapy delivery

## **8. Conclusion**

- Robotic surgery represents a promising frontier in ophthalmology, offering unparalleled precision in delicate procedures.
- Further clinical trials, cost reduction, and training will support wider adoption